EFFECTS OF SPATIAL FORMS OF GREEN INFRASTRUCTURE IN BLOCK SCALE ON PM_{10} AND $PM_{2.5}$ REMOVAL—A CASE STUDY OF THE MAIN CITY OF WUHAN

CHEN, MING
Huazhong University of Science & Technology, Wuhan, China, 1551662341@qq.com

DAI, FEI
Huazhong University of Science & Technology, Wuhan, China, 58801365@qq.com

ZHU, SHENGWEI
Huazhong University of Science & Technology, Wuhan, China, 860276283@qq.com

1 ABSTRACT

Particulate air pollution is a common challenge in the process of rapid urbanization of developing countries. Under the overall particulate air pollution in urban, there are significant differences in the concentration of particulate air pollution in urban blocks, and green infrastructure is an important factor. This research focused on the spatial forms and influence extent of green infrastructure on PM_{10} and $PM_{2.5}$. PM_{10} and $PM_{2.5}$ data were obtained from eight national controlling points and two self controlling points by a research group in Wuhan. And landscape pattern index of green infrastructure of ten blocks was calculated by Fragstats. Correlation analysis showed that concentration was highly correlated in the urban block, spatial forms of green infrastructure and PM_{10}/$PM_{2.5}$. PM_{10}/$PM_{2.5}$ concentration were negatively associated with the total area of patch (CA), but positively associated with patch mean nearest (MNN), patch density (PD), and edge density (ED). Besides, largest patch index (LPI) was almost not associated with PM_{10}/$PM_{2.5}$ concentration. Stepwise multiple regression analyses indicated that the most significant influencing factor on the moderation of particulate matter was the total area of patch (CA), while mean nearest distance of patches (ENN_MN) exhibited a negative impact. According to our findings, we propose that increasing the area of the UGI patches and decreasing the distance among different green patches are two key strategies to reduce the particulate air pollution, which can enrich a new dimension of green infrastructure planning and design.

1.1 Keywords

Green Infrastructure, Particulate Matter, Spatial Forms, Block Scale